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## PATENT CLAIMS

1. System for the oxygen delignification of pulp which consists of lignocellulose-containing material and whose mean concentration is 8-18%, which oxygen delignification takes place in at least two stages and where the system comprises
- a first pump (1) which is arranged to pump the pulp to a first mixer (3) for admixing in this first mixer (3) chemicals which are required for the oxygen delignification, which first mixer is arranged in close conjunction with the first pump,
  - a first delignification zone (6) which is arranged to receive pulp from the first mixer (3),
  - a second pump (4) subsequent to the first delignification zone and ahead of a second delignification zone,
  - a third mixer (5) arranged in close conjunction with the second pump, for admixing in this third mixer (5) chemicals which are required for the oxygen delignification,
  - a second delignification zone (10) which is arranged to receive pulp from the third mixer (5)
- characterized in that
- a second mixer (8) is arranged to receive pulp from the first delignification zone, which second mixer comprises means for admixing steam (MP steam) with the pulp,
  - the second pump (4) is arranged to receive pulp after the second mixer, and has a pumping effect such that a lower oxygen partial pressure is obtained in the first delignification zone as compared with the second delignification zone.
2. System for oxygen delignification according to Claim 1,

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characterized in that the first and third mixers (3 and 5, respectively) are mixers using mechanical agitation, with the pulp at least partially being fluidized in gaps in the mixer, and in that the  
5 second mixer (8) is a static mixer without mechanical agitation.

3. System for oxygen delignification according to Claim 2,  
10 characterized in that it comprises means (O<sub>2</sub>) for adding oxygen to the first (3) and third (5) mixers, respectively, and means (MP steam) for adding steam to the second mixer (8).

15 4. System for oxygen delignification according to Claim 3,  
characterized in that the second mixer comprises means for supplying steam in a controllable manner (7,V,TC), preferably feedback-controlled in  
20 dependence on the temperature of the pulp after the said mixer.

5. System for oxygen delignification according to Claim 4,  
25 characterized in that the second mixer (8) consists of a pulp-conveying pipe having a number of inlet holes for the steam in the wall of the pipe.

6. System for oxygen delignification according to Claim 5,  
30 characterized in that the steam consists of medium-pressure steam at 8-14 bar.

7. System for oxygen delignification according to Claim 3,  
35 characterized in that the system comprises a control system (PC) for controlling the

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rotational speed of the second pump (4) depending on the pressure in the first delignification zone (6).

8. System for oxygen delignification according to Claim 1,

characterized

- in that the first delignification zone (6) has a volume which results in a dwell time of 2-20 minutes, preferably 2-10 minutes, and even more advantageously 3-6 minutes, for the pulp in the first delignification zone,

- in that the system is adjusted such that the pressure in the first delignification zone amounts to 0-6 bar, preferably 0-4 bar,

- in that the second pump (4) has a pumping effect such that the pressure in the second delignification zone reaches a level of at least 3 bars overpressure at the top of the second delignification zone, and

- in that the second delignification zone (10) has a volume which is at least 10 times greater than the volume of the first delignification zone, i.e. has a volume which results in a dwell time of at least 20-200 minutes, preferably 20-100 minutes, and even more advantageously within the range 50-90 minutes.

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9. Process for the oxygen delignification of pulp which consists of lignocellulose-containing material and whose mean concentration is 8-18%, in at least two stages,

characterized

a) in that pulp at median concentration is pressurized, and

b) after that, chemicals, chiefly oxygen, are added for the oxygen delignification, such that oxygen delignification takes place in a first stage in which the pulp is treated for a relatively short time, corresponding to 2-20 minutes, preferably 2-

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- 10 minutes, and even more advantageously 3-6 minutes, under moderate overpressure within the interval 0-6 bar, preferably 0-4 bar, and at a moderate temperature in the range  $85^{\circ}\text{C} \pm 10^{\circ}\text{C}$ ,
- 5 c) and in that the pulp, after the first stage, and with the pulp being at a median concentration, is first mixed together with steam for the purpose of increasing the temperature,
- 10 d) after which there follows a first pressurization of the heated pulp,
- e) and, after that, a second addition of chemicals, chiefly oxygen, for the oxygen delignification,
- 15 f) in order, in a concluding stage, to be treated for a longer time than in the first stage, i.e. for a time which is of the order of magnitude of 10 times longer than in the first stage, in the interval 2-200 minutes, preferably 20-100 minutes, and even more advantageously in the interval 50-90 minutes, with this stage taking place at an
- 20 initial pressure within the interval 8-10 bar, corresponding to the pressure at the inlet of the reactor, but also at a higher temperature, preferably in the range  $100^{\circ}\text{C} \pm 10^{\circ}\text{C}$ , but preferably at least  $5^{\circ}\text{C}$  higher than the
- 25 temperature in the first stage.